

JIG DESIGN

and finished pieces — principally for bar work or something of a similar character. When a round piece of work is to be made up in several sizes and is of simple form, it may often be handled to good advantage in a set of soft jaws applied to a three-jawed universal chuck. These jaws are bored out on the machine to the exact diameter of the finished work, and when set up on the piece they present a good holding surface with sufficient accuracy for the ordinary run of commercial work.

Adjustable Fixture for Holding Castings of Different Diameters. — Fig. 1 shows at *A* and *L* the smallest and largest sizes of castings to be machined on a horizontal turret lathe; and there were two intermediate sizes which were also handled on the same fixtures. A special nose-piece *C* is screwed to the end of the spindle and has a hub at its forward end on which the locating ring *B* (upper view) is fixed. The finished portion of the work fits this ring at *I* and is drawn back against it by the collar *G*; the rod *E* passes through the spindle and is pulled back by means of a hand wheel at the end, while the key *p* prevents it from turning. The forward end of the rod is threaded to receive the knurled finger-nut // which has a spherical bearing in the collar *G* to equalize the pressure. In setting up the work, the piece is placed on the locating ring, the collar *G* is slipped over the end of the rod *H* and the knurled nut // is rapidly screwed on with the fingers, after which the handwheel at the end of the spindle is used to tighten the collar. A long boring tool *.* is used to rough out the shouldered portion of the work and to bore the bearing, and it will be noted that although this tool has considerable overhang it is well set up in the tool-holder *A'*, and given additional strength by the use of two toolposts*

The larger piece *L*, shown in the lower part of the illustration, is set up on the ring *M* locating on the surface *O*, which has been previously bored. A larger collar *A'* is used for clamping this piece. With the exception of the locating ring and collar, all of the other parts of the holding device are the same as in the preceding instance. Additional rings and collars for the intermediate sizes make the fixture complete. It will be